

# **Statement of Basis**

**Permit to Construct No. P-2009.0011  
Project ID 61533**

**Penford Products Company  
Idaho Falls, Idaho**

**Facility ID 019-00026**

**Proposed for Public Comment**

**DRAFT XX, 2015  
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The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01. et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

<b>ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE.....</b>	<b>3</b>
<b>FACILITY INFORMATION.....</b>	<b>5</b>
Description.....	5
Permitting History.....	5
Application Scope.....	6
Application Chronology.....	6
<b>TECHNICAL ANALYSIS.....</b>	<b>6</b>
Emissions Units and Control Equipment .....	6
Emissions Inventories .....	7
Ambient Air Quality Impact Analyses.....	12
<b>REGULATORY ANALYSIS .....</b>	<b>13</b>
Attainment Designation (40 CFR 81.313) .....	13
Facility Classification .....	13
Permit to Construct (IDAPA 58.01.01.201) .....	14
Tier II Operating Permit (IDAPA 58.01.01.401).....	14
Visible Emissions (IDAPA 58.01.01.625).....	14
Particulate Matter – New Equipment Process Weight Limitations (IDAPA 58.01.01.701).....	14
Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70) .....	15
PSD Classification (40 CFR 52.21) .....	15
NSPS Applicability (40 CFR 60).....	15
NESHAP Applicability (40 CFR 61).....	15
MACT Applicability (40 CFR 63).....	15
Permit Conditions Review .....	15
<b>PUBLIC REVIEW .....</b>	<b>16</b>
Public Comment Opportunity .....	16
Public Comment Period .....	16
<b>APPENDIX A – EMISSIONS INVENTORIES .....</b>	<b>17</b>
<b>APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES .....</b>	<b>18</b>
<b>APPENDIX C – FACILITY DRAFT COMMENTS .....</b>	<b>19</b>
<b>APPENDIX D – PROCESSING FEE.....</b>	<b>21</b>

## ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
BACT	<a href="#">Best Available Control Technology</a>
BMP	<a href="#">best management practices</a>
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CAS No.	<a href="#">Chemical Abstracts Service registry number</a>
CBP	<a href="#">concrete batch plant</a>
CEMS	continuous emission monitoring systems
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	<a href="#">compression ignition</a>
CMS	continuous monitoring systems
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	CO <sub>2</sub> equivalent emissions
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FEC	<a href="#">Facility Emissions Cap</a>
GHG	greenhouse gases
<a href="#">gph</a>	<a href="#">gallons per hour</a>
<a href="#">gpm</a>	<a href="#">gallons per minute</a>
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HHV	<a href="#">higher heating value</a>
HMA	<a href="#">hot mix asphalt</a>
hp	<a href="#">horsepower</a>
<a href="#">hr/yr</a>	<a href="#">hours per consecutive 12 calendar month period</a>
ICE	<a href="#">internal combustion engines</a>
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
<a href="#">iwg</a>	<a href="#">inches of water gauge</a>
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
<a href="#">mg/dscm</a>	<a href="#">milligrams per dry standard cubic meter</a>
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NSPS	New Source Performance Standards

O&M	operation and maintenance
O <sub>2</sub>	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
PCB	polychlorinated biphenyl
PERF	Portable Equipment Relocation Form
PM	particulate matter
PM <sub>2.5</sub>	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM <sub>10</sub>	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PW	process weight rate
RAP	recycled asphalt pavement
RFO	reprocessed fuel oil
RICE	reciprocating internal combustion engines
<i>Rules</i>	<i>Rules for the Control of Air Pollution in Idaho</i>
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO <sub>2</sub>	sulfur dioxide
SO <sub>x</sub>	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
TEQ	toxicity equivalent
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
yd <sup>3</sup>	cubic yards
µg/m <sup>3</sup>	micrograms per cubic meter

## **FACILITY INFORMATION**

### ***Description***

Raw starch material is delivered to the Penford Products Company (Penford), Idaho Falls facility in the form of slurry, wet cake, and dried starch. All raw materials are then converted to slurry. The slurry is pumped across screening equipment to remove associated pulp and peel. The slurry is then pumped to holding tanks.

The refined starch is then pumped from the holding tanks to one of the reaction vessels (reactors). Each reactor is equipped with an agitator, as well as top and side mounted inlets for the addition of chemicals. The chemical react with the starch in the reactors to form modified starch products.

After the starch has been modified and neutralized in the reactors it is pumped into a state of the art filtering and dewatering system to remove as much moisture as possible.

The starch is then dried in a flash dryer. The dry starch is then transferred to a storage bin and/or then to separate packaging areas.

The final dry starch product is then shipped in 50-pound paper bags, 25-kg paper bags, 1,000-2,400-pound supersacks, or 180,000-pound bulk railcar shipments.

### ***Permitting History***

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

May 7, 2009	P-2009.0011, Modification to PTC P-2007.0093 to allow for the processing of corn and other fine-grained starches in addition to potato starch at this facility, permit status (A, but will become S upon issuance of this permit).
July 19, 2007	P-2007.0093, Modification to PTC P-030511 for changes to the moisture reduction system (from decant vats where starch was dewatered and re-suspended several times followed by refined screening via a rotary drum vacuum filter to a state of the art filtering and dewatering system) and adding a new air compressor, an air dryer, and a surge tank, permit status (S).
August 18, 2003	P-030511, Modification to PTC P-020510 for upgrades to the dryer bulk transport system and the valve bag packer dust collection system at the potato starch processing facility, permit status (S).
May 2, 2003	P-020510, Modification to PTC 019-00026 to remove the use of ethylene oxide (ETO) for potato starch processing at the facility, permit status (S).
October 30, 1998	019-00026, Modified PTC was issued for the potato starch processing facility to have the PTC correspond with a recently issued consent order, permit status (S).
August 7, 1998	019-00026, Modified PTC was issued for the potato starch processing facility to modify the ethylene oxide scrubber, permit status (S).
April 30, 1996	019-00026, Modified PTC was issued for the potato starch processing facility to install a new ethylene oxide scrubber and a baghouse, permit status (S).
December 9, 1991	0260-0026, Modified PTC was issued for the potato starch processing facility, permit status (S).
October 25, 1989	0260-0026, Initial PTC was issued for the potato starch processing facility, permit status (S).

## Application Scope

The Applicant has proposed to increase the de-watering capacity of the press allowing an increase in process throughput. This increase in process throughput will affect one emissions unit, the starch flash dryer. The Applicant proposes to increase process throughput to 12,000 lb/hr for potato starch (currently permitted at 8,000 lb/hr) and 8,000 lb/hr for corn starch and other fine-grained starches (currently permitted at 6,000 lb/hr).

## Application Chronology

June 9, 2015	DEQ received an application and an application fee.
July 8, 2015	DEQ determined that the application was complete.
July 9 – July 24, 2015	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
August 3, 2015	DEQ made available the draft permit and statement of basis for peer and regional office review.
August 5, 2015	DEQ made available the draft permit and statement of basis for applicant review.
Month Day – Month Day, Year	DEQ provided a public comment period on the proposed action.
Month Day, Year	DEQ received the permit processing fee.
Month Day, Year	DEQ issued the final permit and statement of basis.

## TECHNICAL ANALYSIS

### Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment	Emission Point ID No.
SFDRY	<u>Starch Flash Dryer</u> Manufacturer: Barr Rosin Model: Flash Dryer Model Yr. 1989 Manufacture date: 1989 Max. Production Rate: 12,000 lbs/hr Fuel: Natural gas only	<u>Twin Cyclones</u> <sup>1</sup> Manufacturer: Barr Rosin Model: Twin Cyclone Yr. 1989 Blower Rating: 200 hp	<u>Stack 100</u> Exit height: 50 ft (15.24 m) Exit diameter: 2.73 ft (0.83 m) Exit flow rate: 25,000 acfm Exit temperature: 140 °F (60 °C)
SUSA	<u>Supersack Packaging Hopper</u>	<u>Bin Vent Filter</u>	<u>Stack 104</u> Exit height: 26 ft (7.92 m) Exit diameter: 0.50 ft (0.15 m) Exit flow rate: 649 acfm Exit temperature: 74.9 °F (23.4 °C)
PACKR	<u>Valve Sack Packaging Hopper</u>	<u>Bin Vent Filter</u>	<u>Stack 105</u> Exit height: 26 ft (7.92 m) Exit diameter: 0.50 ft (0.15 m) Exit flow rate: 670 acfm Exit temperature: 74.9 °F (23.4X °C)
EBBIN	<u>East Bulk Storage</u>	<u>Bin Vent Filter</u>	<u>Stack 106</u> Exit height: 38 ft (11.58 m) Exit diameter: 0.50 ft (0.15 m) Exit flow rate: 670 acfm Exit temperature: 74.9 °F (23.4 °C)
WBBIN	<u>West Bulk Storage</u>	<u>Bin Vent Filter</u>	<u>Stack 107</u> Exit height: 38 ft (11.58 m) Exit diameter: 0.50 ft (0.15 m) Exit flow rate: 670 acfm Exit temperature: 74.9 °F (23.4 °C)
	Bulk Railcar Loadout	N/A	

<sup>1</sup> The twin cyclones are considered process equipment, not an air pollution control device.

## Emissions Inventories

### Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit an emission inventory was developed for [the increase in emissions from the Starch Flash Dryer operation at the facility \(see Appendix A\) associated with this proposed project](#). Emissions estimates of PM<sub>10</sub>/PM<sub>2.5</sub> were based on source test results from 1998 and 2008 and process information specific to the facility for this proposed project.

### Uncontrolled Potential to Emit

Using the definition of Potential to Emit, uncontrolled Potential to Emit is then defined as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall **not** be treated as part of its design since the limitation or the effect it would have on emissions **is not** state or federally enforceable.

The uncontrolled Potential to Emit is used to determine if a facility is a “Synthetic Minor” source of emissions. Synthetic Minor sources are facilities that have an uncontrolled Potential to Emit for regulated air pollutants or HAP above the applicable Major Source threshold without permit limits.

The following table presents the uncontrolled Potential to Emit for regulated air pollutants [as submitted by the Applicant and verified by DEQ staff](#). See [Appendix A](#) for a detailed presentation of the [calculations and the assumptions used to determine emissions for each emissions unit](#). For this starch processing operation uncontrolled Potential to Emit is the same as the controlled Potential to Emit because there are no controls or limits on operation placed on the equipment used at the facility.

**Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS**

Source	PM <sub>10</sub> /PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC	CO <sub>2</sub> e
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
<b>Point Sources</b>						
Starch Flash Dryer	17.94	0.02	3.54	2.98	0.19	4,231
Supersack Packaging Hopper Bin Vent	0.03	0.00	0.00	0.00	0.00	0.00
Valve Sack Packaging Hopper Bin Vent	0.22	0.00	0.00	0.00	0.00	0.00
East Bulk Storage Bin Vent	0.03	0.00	0.00	0.00	0.00	0.00
West Bulk Storage Bin Vent	0.03	0.00	0.00	0.00	0.00	0.00
<b>Total, Point Sources</b>	<b>18.25</b>	<b>0.02</b>	<b>3.54</b>	<b>2.98</b>	<b>0.19</b>	<b>4,231</b>

The following table presents the uncontrolled Potential to Emit for HAP pollutants as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit.

**Table 3 UNCONTROLLED POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS**

Hazardous Air Pollutants	PTE (T/yr)
Hexane	6.38E-02
Formaldehyde	2.66E-03
Toluene	1.20E-04
Benzene	7.44E-05
Nickel	7.44E-05
Chromium	4.96E-05
Dichlorobenzene	4.25E-05
Cadmium	3.90E-05
Naphthalene	2.16E-05
Manganese	1.35E-05
Mercury	9.21E-06
Arsenic	7.09E-06
Cobalt	2.98E-06
2-Methylnaphthalene	8.50E-07
Selenium	8.50E-07
Phenanthrene	6.02E-07
7,12-Dimethylbenz(a)anthracene	5.67E-07
Beryllium	4.25E-07
Pyrene	1.77E-07
Fluoranthene	1.06E-07
Anthracene	8.50E-08
3-Methylchloranthene	6.38E-08
Benza(a)anthracene	6.38E-08
Benzo(b)fluoranthene	6.38E-08
Benzo(k)fluoranthene	6.38E-08
Chrysene	6.38E-08
Indeno(1,2,3-cd)Pyrene	6.38E-08
Acenaphthene	6.38E-08
Acenaphthylene	6.38E-08
Dibenzo(a,h)anthracene	4.25E-08
Benzo(a)Pyrene	4.25E-08
Benzo(g,h,i)perylene	4.25E-08
<b>Total</b>	<b>0.067</b>



### Pre-Project Potential to Emit

The following table presents the pre-project potential to emit for all criteria and GHG pollutants from all emissions units at the facility/for the one unit being modified as submitted by the Applicant and verified by DEQ staff. [Since this is a previously permitted facility pre-project emissions were taken from the post project emissions established by the previous permitting project at this facility \(P-2009.0011, dated May 7, 2009\).](#)

**Table 4 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS**

Source	PM <sub>10</sub> /PM <sub>2.5</sub>		SO <sub>2</sub>		NO <sub>x</sub>		CO		VOC		CO <sub>2</sub> e
	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	T/yr <sup>(b)</sup>
Starch Flash Dryer	2.41	9.93	0.00	0.02	0.78	3.20	0.16	0.64	0.06	0.26	4,231
Supersack Packaging Hopper Bin Vent	0.05	0.03	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Valve Sack Packaging Hopper Bin Vent	0.05	0.22	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East Bulk Storage Bin Vent	0.05	0.03	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
West Bulk Storage Bin Vent	0.05	0.03	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
<b>Pre-Project Totals</b>	<b>2.61</b>	<b>10.24</b>	<b>0.00</b>	<b>0.02</b>	<b>0.78</b>	<b>3.20</b>	<b>0.16</b>	<b>0.64</b>	<b>0.06</b>	<b>0.26</b>	<b>4,231</b>

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.

b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

### Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post project Potential to Emit for criteria and GHG pollutants from [all emissions units at the facility](#) as determined by DEQ staff. See [Appendix A](#) for a detailed presentation of the calculations of these emissions for each emissions unit.

**Table 5 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS**

Source	PM <sub>10</sub> /PM <sub>2.5</sub>		SO <sub>2</sub>		NO <sub>x</sub>		CO		VOC		CO <sub>2</sub> e
	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	T/yr <sup>(b)</sup>
Starch Flash Dryer	4.10	17.94	0.00	0.02	0.81	3.54	0.68	2.98	0.04	0.19	4,231
Supersack Packaging Hopper Bin Vent	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Valve Sack Packaging Hopper Bin Vent	0.05	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
East Bulk Storage Bin Vent	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
West Bulk Storage Bin Vent	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Post Project Totals</b>	<b>4.30</b>	<b>18.25</b>	<b>0.00</b>	<b>0.02</b>	<b>0.81</b>	<b>3.54</b>	<b>0.68</b>	<b>2.98</b>	<b>0.04</b>	<b>0.19</b>	<b>4,231</b>

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.

b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

### Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

**Table 6 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS**

Source	PM <sub>10</sub> /PM <sub>2.5</sub>		SO <sub>2</sub>		NO <sub>x</sub>		CO		VOC		CO <sub>2</sub> e
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	T/yr
Pre-Project Potential to Emit	2.61	10.24	0.00	0.02	0.78	3.20	0.16	0.64	0.06	0.26	4,231
Post Project Potential to Emit	4.30	18.25	0.00	0.02	0.81	3.54	0.68	2.98	0.04	0.19	4,231
<b>Changes in Potential to Emit</b>	<b>1.69</b>	<b>8.01</b>	<b>0.00</b>	<b>0.00</b>	<b>0.03</b>	<b>0.34</b>	<b>0.52</b>	<b>2.34</b>	<b>-0.02</b>	<b>-0.07</b>	<b>0.00</b>

### Non-Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of **non-carcinogenic** toxic air pollutants (TAP) is provided in the following table. **Note: TAPs emissions for the project are the result of natural gas combustion. As there is no change in the amount of natural gas combusted as a result of this project, there is no change in TAPs emissions as a result of this project.**

**Table 7 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS**

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Dichlorobenzene	9.71E-06	9.71E-06	0.0000	20	No
Hexane	1.46E-02	1.46E-02	0.0000	12	No
Naphthalene	4.93E-06	4.93E-06	0.0000	3.33	No
Pentane	2.10E-02	2.10E-02	0.0000	118	No
Toluene	2.75E-05	2.75E-05	0.0000	25	No
Barium	3.56E-05	3.56E-05	0.0000	0.033	No
Chromium	1.13E-05	1.13E-05	0.0000	0.033	No
Cobalt metal, dust, and fume	6.79E-07	6.79E-07	0.0000	0.0033	No
Copper fume	6.88E-06	6.88E-06	0.0000	0.013	No
Manganese fume	3.07E-06	3.07E-06	0.0000	0.067	No
Molybdenum soluble	8.90E-06	8.90E-06	0.0000	0.333	No
Selenium	1.94E-07	1.94E-07	0.0000	0.013	No
Vanadium	1.86E-05	1.86E-05	0.0000	0.003	No
Zinc oxide dust	2.35E-04	2.35E-04	0.0000	0.667	No

None of the PTEs for non-carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is not required for any non-carcinogenic TAP because none of the 24-hour average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

### **Carcinogenic TAP Emissions**

A summary of the estimated PTE for emissions increase of **carcinogenic** toxic air pollutants (TAP) is provided in the following table. **Note:** As discussed previously, TAPs emissions for the project are the result of natural gas combustion. As there is no change in the amount of natural gas combusted as a result of this project, there is no change in TAPs emissions as a result of this project.

**Table 8 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS**

<b>Carcinogenic Toxic Air Pollutants</b>	<b>Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>Carcinogenic Screening Emission Level (lb/hr)</b>	<b>Exceeds Screening Level? (Y/N)</b>
3-Methylchloranthene	1.46E-08	1.46E-08	0.0000	2.5E-06	No
PAH,except 7-PAH group	9.22E-08	9.22E-08	0.0000	2.0E-06	No
POM, 7-PAH Group	2.83E-07	2.83E-07	0.0000	9.1E-05	No
Benzene	1.70E-05	1.70E-05	0.0000	8.0E-04	No
Formaldehyde	6.07E-04	6.07E-04	0.0000	5.1E-04	No
Arsenic	1.62E-06	1.62E-06	0.0000	1.5E-06	No
Beryllium	9.71E-08	9.71E-08	0.0000	2.8E-05	No
Cadmium	8.90E-06	8.90E-06	0.0000	3.7E-06	No
Nickel	1.70E-05	1.70E-05	0.0000	2.7E-05	No

a) Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

None of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is not required for any carcinogenic TAP because none of the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

## **Post Project HAP Emissions**

The following table presents the post project potential to emit for HAP pollutants from [all emissions units at the facility/for the one unit being modified](#) as submitted by the Applicant and verified by DEQ staff. See [Appendix A](#) for a detailed presentation of the calculations of these emissions for each emissions unit.

**Table 9 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY**

<b>Hazardous Air Pollutants</b>	<b>PTE (T/yr)</b>
Hexane	6.38E-02
Formaldehyde	2.66E-03
Toluene	1.20E-04
Benzene	7.44E-05
Nickel	7.44E-05
Chromium	4.96E-05
Dichlorobenzene	4.25E-05
Cadmium	3.90E-05
Naphthalene	2.16E-05
Manganese	1.35E-05
Mercury	9.21E-06
Arsenic	7.09E-06
Cobalt	2.98E-06
2-Methylnaphthalene	8.50E-07
Selenium	8.50E-07
Phenanthrene	6.02E-07
7,12-Dimethylbenz(a)anthracene	5.67E-07
Beryllium	4.25E-07
Pyrene	1.77E-07
Fluoranthene	1.06E-07
Anthracene	8.50E-08
3-Methylchloranthene	6.38E-08
Benzo(a)anthracene	6.38E-08
Benzo(b)fluoranthene	6.38E-08
Benzo(k)fluoranthene	6.38E-08
Chrysene	6.38E-08
Indeno(1,2,3-cd)Pyrene	6.38E-08
Acenaphthene	6.38E-08
Acenaphthylene	6.38E-08
Dibenzo(a,h)anthracene	4.25E-08
Benzo(a)Pyrene	4.25E-08
Benzo(g,h,i)perylene	4.25E-08
<b>Totals</b>	<b>0.067</b>

## ***Ambient Air Quality Impact Analyses***

As presented in the Modeling Memo in [Appendix B](#), the estimated emission rates of **PM<sub>10</sub>** and **PM<sub>2.5</sub>** from this project [exceeded](#) applicable Level I emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline<sup>1</sup>. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC).

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<sup>1</sup> Criteria pollutant thresholds in Table 2, State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011, September 2013.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see [Appendix B](#)).

## REGULATORY ANALYSIS

### ***Attainment Designation (40 CFR 81.313)***

The facility is located in [Bonneville](#) County, which is designated as attainment or unclassifiable for PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub>, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

### ***Facility Classification***

The AIRS/AFS facility classification codes are as follows:

For THAPs (Total Hazardous Air Pollutants) Only:

- A = Use when any one HAP has actual or potential emissions  $\geq 10$  T/yr or if the aggregate of all HAPS (Total HAPs) has actual or potential emissions  $\geq 25$  T/yr.
- SM80 = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the permit sets limits  $\geq 8$  T/yr of a single HAP or  $\geq 20$  T/yr of THAP.
- SM = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the potential HAP emissions are limited to  $< 8$  T/yr of a single HAP and/or  $< 20$  T/yr of THAP.
- B = Use when the potential to emit without permit restrictions is below the 10 and 25 T/yr major source threshold
- UNK = Class is unknown

For All Other Pollutants:

- A = Actual or potential emissions of a pollutant are  $\geq 100$  T/yr.
- SM80 = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are  $\geq 80$  T/yr.
- SM = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are  $< 80$  T/yr.
- B = Actual and potential emissions are  $< 100$  T/yr without permit restrictions.
- UNK = Class is unknown.

**Table 10 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION**

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	18.25	18.25	100	B
PM <sub>10</sub> /PM <sub>2.5</sub>	18.25	18.25	100	B
SO <sub>2</sub>	0.02	0.02	100	B
NO <sub>x</sub>	3.54	3.54	100	B
CO	2.98	2.98	100	B
VOC	0.19	0.19	100	B
HAP (single)	6.38E-02	6.38E-02	10	B
HAP (Total)	0.067	0.067	25	B

**Permit to Construct (IDAPA 58.01.01.201)**

IDAPA 58.01.01.201

Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the [modified starch flash dryer](#). Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

**Tier II Operating Permit (IDAPA 58.01.01.401)**

IDAPA 58.01.01.401

Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

**Visible Emissions (IDAPA 58.01.01.625)**

IDAPA 58.01.01.625

Visible Emissions

The sources of PM<sub>10</sub> emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions [2.4](#) and [3.4](#).

**Particulate Matter – New Equipment Process Weight Limitations (IDAPA 58.01.01.701)**

IDAPA 58.01.01.701

Particulate Matter – New Equipment Process Weight Limitations

IDAPA 58.01.01.700 through 703 set PM emission limits for process equipment based on when the piece of equipment commenced operation and the piece of equipment's process weight (PW) in pounds per hour (lb/hr). IDAPA 58.01.01.701 and IDAPA 58.01.01.702 establish PM emission limits for equipment that commenced operation on or after October 1, 1979 and for equipment operating prior to October 1, 1979, respectively.

For equipment that commenced operation on or after October 1, 1979, the PM allowable emission rate (E) is based on one of the following four equations:

IDAPA 58.01.01.701.01.a: If PW is < 9,250 lb/hr;  $E = 0.045 (PW)^{0.60}$

IDAPA 58.01.01.701.01.b: If PW is  $\geq 9,250$  lb/hr;  $E = 1.10 (PW)^{0.25}$

For equipment that commenced prior to October 1, 1979, the PM allowable emission rate is based on one of the following equations:

IDAPA 58.01.01.702.01.a: If PW is < 17,000 lb/hr;  $E = 0.045 (PW)^{0.60}$

IDAPA 58.01.01.702.01.b: If PW is  $\geq 17,000$  lb/hr;  $E = 1.12 (PW)^{0.27}$

For the existing [starch flash dryer](#) emissions unit that commenced operation on or after October 1, 1979 to be modified as a result of this project with a proposed throughput of 10.0 T/hr (20,000 lb/hr), E is calculated as follows:

Proposed throughput = 10.0 T/hr x 2,000 lb/1 T = 20,000 lb/hr

Therefore, E is calculated as:

$$E = 1.10 \times PW^{0.25} = 1.10 \times (20,000)^{0.25} = 13.08 \text{ lb-PM/hr}$$

As presented previously in the Emissions Inventories Section of this evaluation the post project PTE for the starch flash dryer emissions unit is 4.10 lb-PM<sub>10</sub>/hr. Assuming PM is 50% PM<sub>10</sub> means that PM emissions will be 8.20 lb-PM/hr (4.10 lb-PM<sub>10</sub>/hr ÷ 0.5 lb-PM<sub>10</sub>/lb-PM). Therefore, compliance with this requirement has been demonstrated.

### ***Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)***

IDAPA 58.01.01.301

Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for (list pollutants, i.e., PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, VOC, and HAP) or 10 tons per year for any one HAP or 25 tons per year for all HAP combined (list HAP or HAP) as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

### ***PSD Classification (40 CFR 52.21)***

40 CFR 52.21

Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is/is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

### ***NSPS Applicability (40 CFR 60)***

The facility is not subject to any NSPS requirements 40 CFR Part 60.

### ***NESHAP Applicability (40 CFR 61)***

The facility is not subject to any NESHAP requirements in 40 CFR 61.

### ***MACT Applicability (40 CFR 63)***

The facility is not subject to any MACT standards in 40 CFR Part 63.

### ***Permit Conditions Review***

This section describes only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Permit Condition 1.1 describes the modifications to the existing processes at the facility process being permitted as a result of this project.

Permit Condition 1.3 explains which previous permit for the facility is being replaced as a result of this project.

Table 1.1 was updated to reflect the change in throughput being proposed as a result of this project.

## ***NATURAL GAS-FIRED STARCH FLASH DRYER***

Table 2.2 was updated to reflect the increase in emissions due to the increase in throughput being proposed as a result of this project.

Permit Condition 2.6 was modified to allow the new potato starch processing limit as proposed by the Applicant.

Permit Condition 2.7 was modified to allow the new corn starch and other fine-grained starches processing limit as proposed by the Applicant.

## **PUBLIC REVIEW**

### ***Public Comment Opportunity***

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c. During this time, there were comments on the application and there was a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

### ***Public Comment Period***

A public comment period was made available to the public in accordance with IDAPA 58.01.01.209.01.c. During this time, comments were/were not submitted in response to DEQ's proposed action. Refer to the chronology for public comment period dates.

***{comments received}*** A response to public comments document has been crafted by DEQ based on comments submitted during the public comment period. That document is part of the final permit package for this permitting action.



## **APPENDIX A – EMISSIONS INVENTORIES**

## **APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES**

## **APPENDIX C – FACILITY DRAFT COMMENTS**

**The following comments were received from the facility on August 13, 2015:**

**Facility Comment:** Statement of Basis, Emissions Inventories, Potential to Emit – There is a discrepancy between the emissions shown in Tables 4 and 6 of the Statement of Basis for pre-project and change in emissions of the Starch Flash Dryer and the emissions shown in Tables 1 and 3 of the Statement of Basis. The emissions in Table 4 are from the previous permit. The emissions in Appendix A are emissions that we recalculated for the permit application from the source test conducted in 1998 and with the use of AP-42 emission factors. The use of either previously permitted or recalculated emissions makes no difference in modelling requirements or results; however, using the previous permit emissions may lead one to believe that emissions from natural gas combustion will increase. Since there is no increase in natural gas usage or emissions, this is a false conclusion. Indeed, the tables for the toxic air pollutants arising from the natural gas combustion show no change in emissions and thus contradict the conclusion of Table 6. Therefore, Penford requests that the emissions recalculated for the permit application as presented in Appendix A be used in the Statement of Basis with an explanation for the change.

In addition to the discrepancy above, Table 5 of the Statement of Basis does not total the hourly emissions for NO<sub>x</sub>, CO, and VOC. Penford requests that these totals be added to the table.

As discussed, please make clear in the permit the reason for the apparent change in TAP emissions (i.e., the difference between previously permitted emissions and the calculated emissions for the permit application) is not due to any production or fuel combustion increase; instead, it is likely due to the change in calculation methodology.

**DEQ Response:** Pre-project emissions were taken from the Statement of Basis from the previous permitting project which established Post Project emissions at that time. The Post Project emissions were the basis for the issuance of the previous permit in May 2009. Therefore, Pre-Project emissions for this project will not be changed to accommodate a change in the emissions calculation methodology. A note will be placed in the TAPs emissions calculation section explaining that there is no change in the natural gas combustion rate as a result of this project.

**Facility Comment:** Statement of Basis, Technical Analysis, Table 1 and Permit, Regulated Sources, Table 1.1 - The facility would like to upgrade the blower for the twin cyclones installed on its Starch Flash Dryer. As stated in Table 1.1 of the draft permit, the current motor has a 150 horsepower (hp) rating. This rating is inadequate for the design conditions and a larger rated motor would correct an operational deficiency. There would be no change in emissions with this upgrade as both the current and proposed motors are electric. In addition, the size of the motor does not change the stack flow characteristics. Therefore, Penford requests that Table 1.1 be updated to show a blower rating of 200 hp. This upgrade should occur by the time the permit is issued.

**DEQ Response:** The requested change will be made to the Statement of Basis and the permit.

## **APPENDIX D – PROCESSING FEE**